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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/924,021

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Tomoaki Ito

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EXAMINER

SIEFKE, SAMUEL P

ART UNIT

PAPER NUMBER

1743

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,021

Applicant(s)

ITO ET AL.

Examiner

Samuel P Siefke

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 7-13, 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 14-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6 and 14-20, drawn to method of monitoring carbonic acid from an outlet of an anion exchange resin, classified in class 205, subclass 781.5.
- II. Claim 7-9 and 21, drawn to a method of comparing measurements of anion exchange resin, classified in class 436, subclass 133.
- III. Claims 10-13 and 22, drawn to evaluating the inlet water and outlet water on a reference resin to the sample resin, classified in class 436, subclass 178.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the concentration of carbonic acid alone can provide results of an exhausted anion resin. The subcombination has separate utility such as estimating an anion exchange resin exhaustion point.

Inventions Group I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the concentration of carbonic acid alone can provide results of an exhausted anion resin. The subcombination has separate utility such as monitoring the input and output for quality assurance, to make sure the anion exchange resin is functional.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Johnathan Osha on December 3, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-6 and 14-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-13 and 21-22 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim **1-4, 14-17** are rejected under 35 U.S.C. 102(b) as being anticipated by Ammer (USPN 3,839,162).

Ammer discloses a method for the determination of the concentration of relevant ions in an aqueous solution. The method comprises measuring the inorganic carbonic acid concentration in the outlet water of an ion exchange resin vessel filled with at least an anion exchange resin (col. 6, line 36); and evaluating the performance (col. 6, lines 40-44; exhaustion) of the anion exchange resin filled in said ion exchange resin vessel based on the obtained measurement value of the inorganic carbonic acid concentration in the outlet water (col. 4, line 46- col. 5, line 2; col. 6, lines 15-44; col. 8, line 2-4). The method is performed on a continuous measurements being taken (col. 7, lines 3-5).

Ammer discloses that continuous silicic acid measurement which might be successfully applied in this case is inefficient, if not silicic acid but carbonic acid breaks through first, rendering a continuous measurement for carbonic acid possible because it breaks through first. Claim 1 of the prior art states that a known value of the concentrations of the specific ions in a third aqueous solution are directed to an ion exchanger. A first aqueous solution is put through the ion exchanger and the concentrations of the first aqueous solution specific ions are known. A second aqueous solution is then put

through the ion exchanger and the concentrations of the specific ions in the second aqueous solution are measured. At a given time, the inlet and the outlet of the ion exchange resin have known concentrations of carbonic acid.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims **5,6,18-20** rejected under 35 U.S.C. 103(a) as being unpatentable over Ammer (USPN 3,839,162) in view of Tasaki (USPN 5,902,833).

Ammer discloses a method for the determination of the concentration of relevant ions in an aqueous solution as discussed above.

Ammer does not teach calculating a mass transfer coefficient of the anion exchange resin with respect to the inorganic carbonic acid from the measured values for the inorganic carbonic acid concentrations. Tasaki teaches that it is a common practice

among industrial users of mixed bed ion exchange systems to characterized resin kinetic properties by determining mass transfer coefficients for the resins for estimations of the potential performance and the projected degree of deterioration of ion exchange resins (col. 4, line 59- col. 5, line 43). It would have been obvious to one having an ordinary skill in the art to characterize the ion exchange resins of Ammer to determine the mass transfer coefficients in order to give better estimations of when an ion exchange resin will be exhausted.

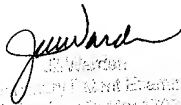
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel P Siefke whose telephone number is 703-306-0093. The examiner can normally be reached on M-F 7:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 703-308-4037. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9311.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Sam P. Siefke


Jill A. Warden
Supervisor
Art Unit 1743

December 3, 2003